THE UNITED STATES DISTRICT COURT FOR
THE DISTRICT OF MARYLAND

UNITED STATES OF AMERICA	*	
	*	Criminal No. WDQ-08-086
Plaintiff,	*	
v.	*	
TAVON MOUZONE,	*	
Defendant.	*	

* * * * * * * * * * * * * *

REPORT AND RECOMMENDATION

On February 21, 2008, Defendants Tavon Mouzone, Anthony Fleming, Sherman Pride, Keili Dyson, Ronnie Thomas, and Jerrod Fenwick were indicted on charges of violating 18 U.S.C. § 1962(d), Conspiracy to Participate in a Racketeering Enterprise.[1] Paper No. 1. Alleged involvement in homicides underlay the Defendants' charges. *Id.*

On August 10, 2009, Defendant Mouzone filed a Motion to Suppress Firearms Identification on the Basis of Scientific Invalidity ("Def.'s R. 702 Mot."), Paper No. 566, and a Motion to Suppress Firearms Identification ("Def.'s R. 16 Mot."), Paper No. 565. In addition, on September 24, 2009, he filed a Supplementary Affidavit in Support of Defendant Mouzone's Motion to Suppress Firearms Identification of the Basis of Scientific Invalidity and Motion to Suppress Firearms Identification, , and an Affidavit of Adina Schwartz ("Aff."). Paper Nos. 639, 639-1, & 639-2. To the Affidavit, Professor Schwartz attached Sergeant Mark K. Ensor's

[1] Defendants Fleming, Dyson, Pride, and Fenwick were also indicted on other charges not relevant to this Report and Recommendation. Paper No. 1.

laboratory reports of August 10, 2007 ("Report 1"); September 27, 2007 ("Report 2"); and July 23, 2008 ("Report 3").[2] Aff., Exs. A-C; Paper Nos. 639-3 – 639-5.

On August 13, 2009, Defendant Anthony Fleming filed a Motion to Adopt Motion to Suppress Firearms Expert Testimony, Paper No. 571, and on October 10, 2009, Defendant Fleming filed a Motion to Adopt and Join Motion to Suppress Firearms Testimony, Paper No. 657, which Judge Quarles granted on October 14, 2009, Paper No. 663. On October 16, 2009, the Government filed the Government's Memorandum of Law in Opposition to Defendant Tavon Mouzone's Motion to Suppress Firearms Identification on the Basis of Scientific Invalidity.[3] Paper No. 676. On October 21, 2009, Defendant Mouzone filed his Response to Government's Reply to Defendant's Motion to Suppress Firearms Identification. Paper No. 689. Additionally, Judge Quarles issued an order, Paper No. 688, on October 21, 2009, permitting any other co-defendant to join in Mouzone's motion. Defendants Sherman Pride, Keili Dyson, Ronnie Thomas, and Jerrod Fenwick did so.[4] Paper Nos. 679, 681, 684, 690.

On October 9, 2009, and October 16, 2009, in accordance with 28 U.S.C. § 636 and Local Rules 301 and 302, Judge Quarles referred this case to me to conduct a hearing and prepare a Report and Recommendation with regard to these motions to suppress evidence. Paper Nos. 655 & 678. For the reasons stated herein, I recommend that Defendant Mouzone's motion

[2] As discussed in further detail *infra*, Sgt. Ensor is a firearms examiner in the Firearms Identification Unit of the Forensic Services Section of the Baltimore County Police Department.

[3] On October 9, 2009, the Court ordered that any opposition memorandum be filed by close of business on October 14, 2009. Paper No. 660. And, on October 15, 2009, the Court granted the Government's October 14, 2009 request to extend the deadline to October 16, 2009 (Paper No. 668). Paper No. 671.

[4] For ease of understanding in this Report and Recommendation, I shall refer solely to Defendant Mouzone's motions. These references are meant to include the arguments adopted by Mouzone's co-defendants as well.

be GRANTED IN PART and DENIED IN PART and, if adopted by Judge Quarles, this Report and Recommendation will address the same issues adopted by all co-defendants who joined in Mouzone's motion. This Report and Recommendation addresses Paper Nos. 565, 566, 571, 639, 657, 676, and 689, as well as Paper Nos. 679, 681, 684, and 690, to the extent they pertain to Defendant Mouzone's motions.

I. Defendant Mouzone's Rule 702 Motion

As noted, the Defendant Mouzone's charges stem from the allegation that he participated in two homicides, one of which occurred on November 17, 2006, on Streeper Street in Baltimore City, and the other of which occurred on December 17, 2006, on Rumelia Circle in Essex, Baltimore County, Maryland. Def.'s R. 16 Mot. ¶ 1. The Government informed the Defendant that "a Baltimore County firearms examiner . . . concluded that a "match" exists between the cartridge casings found at the two scenes." *Id.* ¶ 2.

Anticipating that "the government will wish to introduce this testimony to a reasonable degree of scientific certainty,"[5] Defendant Mouzone contends that such testimony is inadmissible under Fed. R. Evid. 702 because "comparisons of cartridge casing-to-cartridge casing are unreliable" and "scientifically invalid." Def.'s R. 702 Mot. ¶¶ 4, 8-9. Defendant Mouzone's objections to the evidence appear in Professor Schwartz's Affidavit. Paper No. 639-2. Professor Schwartz is a Professor at John Jay College of Criminal Justice and The Graduate Center, City University of New York, and she has testified at hearings and provided affidavits in numerous

[5] At a hearing held October 26, 2009, the Government stated that it sought to introduce this testimony "to a reasonable degree of technical certainty." Hr'g Tr. 10/26/09.

Because the trial is starting in less than a week and the transcript is not yet available for specific page references, this Report and Recommendation refers generally to the hearing transcript.

cases addressing this issue.[6] *E.g.*, *United States v. Taylor*, No. CR 07-1244, 2009 WL 3347485 (D.N.M. Oct. 9, 2009); *United States v. Glynn*, 578 F. Supp. 2d 567 (S.D.N.Y. 2008); *United States v. Diaz*, No. 05-167, 2007 WL 485967 (N.D. Cal. Feb. 12, 2007) (unpublished); *United States v. Monteiro*, 407 F. Supp. 2d 351 (D. Mass. 2006). The Affidavit challenges the admissibility of firearm toolmark identification evidence in general and the admissibility of the findings and opinions of Baltimore County firearms examiner Sergeant Mark Ensor in particular. Aff. 4-49. Professor Schwartz asserts in her affidavit:

1. The assumption that firearm toolmarks are unique and reproducible "has not yet been fully demonstrated." Aff. 7, ¶ 9.

2. Even if the required research were done, and it showed that firearm toolmarks were unique and reproducible, that still would not be sufficient to make toolmark identification a "science" because toolmark examiners have no reliable methods for determining whether different toolmarks were created by the same weapon. Aff. 9, ¶ 10.

3. Toolmark identification methods are unreliable because toolmark examiners are unable to isolate and identify toolmarks with individual characteristics from those with class or subclass characteristics. Aff. 10-11, ¶¶ 11-12.

4. There are three major difficulties preventing the reliable identification of "one and only one" weapon as the source of a specific toolmark. Aff. 12, ¶ 14.

5. The first difficulty is the practice of referring to different, overlapping types of marks as "individual characteristics." For example, sometimes the term

[6] Although a prolific critic of firearm toolmark identification methodology, and a peripatetic defense witness, Professor Schwartz is not herself a firearms toolmark examiner. *United States v. Monteiro*, 407 F. Supp. 2d 351, 367 (D. Mass. 2006).

"individual characteristics" is used to refer collectively to the microscopic markings that comprise a unique toolmark; at other times "individual characteristics" is used to refer to the individual components that, while not unique to any one tool, come together to comprise an allegedly unique toolmark. Aff. 12, ¶ 14.

6. The second difficulty is that misidentifications occur when an examiner presumes that the resemblance between the non-unique, overlapping, individual marks of the test and evidence toolmarks is proof that the toolmarks were produced by the same weapon, when such resemblance is possible in marks made by different weapons. Aff. 13, ¶ 15.

7. The third difficulty is that toolmarks produced by the same tool are not always the same. Aff. 15, ¶ 17.

8. A toolmark can change overtime as the surface of an individual tool changes due to use, damage, and corrosion. Aff. 16, ¶ 17.

9. As a result, sometimes differences in toolmarks are correctly attributed to changes in the surfaces of a particular tool. At other times such a conclusion is wrong, such as when differences in toolmarks exist because the marks were made by different, albeit very similar, tools. Aff. 18, ¶ 18.

10. Differences in toolmarks made by the same tool may also occur because the "pressure and velocity involved" when the tool and ammunition interact at firing "are subject to intrinsic variation from shot to shot." Aff. 17, ¶ 17.

11. Subclass characteristics that are made by more than one tool, such as microscopic striations on bullets, may be confused with individual characteristics that can be created by one and only one tool. Aff. 19, ¶ 19.

12. As the manufacturing process continues to improve, the shared subclass characteristics of large numbers of weapons will increase the risk of misidentifications. Aff. 23, ¶ 22.

13. Presently, no "strict rules" exist for determining whether a toolmark is made by a subclass or individual characteristic. Aff. 21, ¶ 20.

14. Moreover, notwithstanding the "rules of thumb" present in some publications, there exists no authoritative guidance regarding which tools or manufacturing processes produce tools that create toolmarks with subclass characteristics; instead, examiners rely on their personal familiarity and experience with various tools, finishes, and forming. Aff. 21, ¶ 20.

15. There is an even greater risk of confusing these two classes of characteristics when an examiner compares toolmarks from various component parts of ammunition to determine whether they were produced by the same gun. Aff. 22, ¶ 21.

16. Because of the difficulties associated with reliably identifying whether a particular toolmark has been created by a specific weapon, especially when toolmarks from different weapons are sometimes very similar, and toolmarks from the same weapon are occasionally somewhat different, identifications are naturally probabilistic. Aff. 24, ¶ 23.

17. The necessary empirical and statistical work required to overcome the unreliability of the methods presently used has yet to be done. Aff. 26, ¶ 25; Aff. 27 ¶ 26.

18. Examiners are unable to articulate the criteria upon which they base their conclusions; they rely instead on their experience, making each identification a subjective determination. Aff. 26, ¶ 25.

19. Toolmark examiners may disagree with each other if they are applying different criteria for concluding that a match exists. Aff. 35, ¶ 37.

20. The same toolmark examiner might even reach different conclusions in a particular case over time by applying different "mind's eye identification criteria" to the same evidence. Aff. 35, ¶ 37.

21. Many examiners are not trained scientists, but rather technicians; therefore, they do not understand empirical and statistical studies regarding firearm toolmarks and the probabilities regarding the likelihood that another firearm could have made the toolmarks observed. Aff. 35, ¶ 36.

22. The Association of Firearm and Tool Mark Examiners ("AFTE")[7] theory of firearm toolmark identification provides no "objective guidance" regarding when an examiner should declare a match. Aff. 28, ¶ 27.

23. Examiners in different parts of the United States, based on their various experiences with differing weapons, will likely arrive at different conclusions regarding identifications. Aff. 29, ¶ 27.

24. Some examiners, but not a majority of them, rather than using the wholly subjective approach, employ the consecutive matching striae ("CMS") criteria when attempting to identify toolmarks. Aff. 29, ¶ 28.

25. CMS, though better than the traditional subjective approach to toolmark identification, is nonetheless a "highly imperfect attempt to incorporate statistical empirical data into toolmark identifications." Aff. 32, ¶ 32.

[7] AFTE is the leading proponent of the theory of firearms toolmark identification followed by the vast majority of examiners.

26. There are questions regarding whether the CMS criteria were derived from databases that are relevant to and representative of firearm toolmarks. Aff. 33, ¶ 34.

27. CMS may not be a more objective method of toolmark identification, but rather a way for examiners to describe their subjective observations when comparing striated toolmarks. Aff. 31, ¶ 30.

28. Some argue that CMS is a subjective process because it essentially amounts to line-counting. Aff. 33, ¶ 34.

29. CMS applies only to striated toolmarks, and not to breech face marks or firing pin impressions, and only to individual, as opposed to subclass, characteristics. Aff. 32, ¶ 33.

30. Misapplication of the CMS criteria may result in misidentifications. Aff. 33, ¶ 33.

31. Without objective, strict criteria for determining whether toolmark identifications are correct in a given case, it is impossible to calculate an error rate for the discipline of firearm toolmark identifications. Aff. 36, ¶ 38.

32. The only widely used proficiency tests for firearm toolmark examiners, the Collaborative Testing Services ("CTS") tests, cannot provide an accurate error rate because the tests are declared, as opposed to blind, thereby introducing the potential for bias, and the proficiency test problems are simpler than the "real" firearm toolmark identifications the examiners encounter in actual cases. Aff. 37, ¶ 39.

33. Because the only firearm the examiner is given is the one believed to be evidence of a crime, confirmation bias also undermines the validity of toolmark identifications. Aff. 40, ¶ 41.

34. Bias also can play a role in identifications if peer review of the original examiner's work is performed only when identifications are reached. Aff. 41, ¶ 41.

35. Because examiners work closely with law enforcement and prosecution, bias can affect the examiners' conclusions. Aff. 41, ¶ 42

36. Scrutiny by the scientific community at large might resolve some of the problems surrounding toolmark identification, but access to firearm toolmark publications is not largely accessible. Aff. 42, ¶ 43.

37. Many articles published in the *AFTE Journal* are not available on-line to the public, even those willing to pay for it. On-line access is limited to AFTE members, who must be practicing or students in the field of firearm toolmarks, and to honorary members. Non-members may access hard copies of the *AFTE Journal*, but it is only available at one school on the West Coast, and two on the East Coast. Aff. 42-43, ¶ 43.

38. The specific procedures in this case departed greatly from the widely accepted practices within the field. Aff. 43, ¶ 44.

39. Sgt. Ensor failed to provide the documentation in support of his conclusions that would make possible any meaningful peer review. Aff. 43, ¶ 44.

40. The three laboratory reports list "multiple, bare bones cartridge case and bullet identification conclusions," but fail to include "bench notes, diagrams, photomicrographs or narrative descriptions" as to how the conclusions were reached. Aff. 46, ¶ 44.

41. The lack of documentation makes it impossible to determine the types of toolmarks upon which the conclusions were based; the particular lands or grooves on the various bullets on which the identifications were based; the extent of the resemblances

and differences between the toolmarks found on the various bullets and casings; whether and how the toolmarks were differentiated by class, subclass, and individual characteristics; and what criteria he relied upon in determining whether the resemblances were sufficient to support his conclusions. Aff. 46, ¶ 45.

42. Nothing in the documentation explains why or how Sgt. Ensor came to different conclusions on different dates, August 10, 2007 and September 27, 2007, regarding the same cartridge cases. Aff. 46, ¶ 45.

43. The only evidence of any peer review performed on Sgt. Ensor's work is the signature of one other officer on the August 10, 2007 report. There exists no evidence that either the July 23, 2008 laboratory report, or the September 27, 2007 report was ever peer reviewed. Aff. 48, ¶ 46.

44. The peer review of the August 10, 2007 report did nothing to correct Sgt. Ensor's failure to document the reasons for his conclusions, and there is no indication that the peer review was blind. Aff. 48, ¶ 46.

45. Because only one individual peer reviewed Sgt. Ensor's laboratory report, the laboratory failed to follow operating procedures that provide that peer review should be performed "by a minimum of two personnel."

Professor Schwartz testified during the hearing held October 26, 2009, and her testimony was consistent with her Affidavit, though it referred to additional reference materials. Hr'g Tr. 10/26/09. While her Affidavit, which preceded the Defense's receipt of the underlying documentation from the Government, addressed the deficiencies in Sgt. Ensor's methodology, her testimony focused on the unreliability of firearm toolmark identification in general.

The Government contends that the Court should deny Defendant Mouzone's motion and "allow the government's firearms experts to state their opinions as they wish," because it would be "consistent with the weight of authority . . . to allow the government's firearms identification witness to state an opinion to a reasonable degree of ballistic certainty . . . ." Gov.'s Opp'n 1, 5. The Government contends that its experts "have extensive professional and training qualifications, work in labs with thorough peer review, and maintained notes and reports concerning their findings." Gov.'s Opp'n 4 n.3. The Government also filed a motion on October 23, 2009, seeking to disqualify Professor Schwartz from testifying. Paper No. 695. Defendant Mouzone has not had an opportunity to file an opposition. However, as I stated at the hearing, this motion has not been referred to me for a report and recommendation, and is not directly addressed herein. Hr'g Tr. 10/26/09.

The hearing was held on October 26, 2009. Sgt. Ensor testified as a witness for the Government, and Professor Schwartz testified for the defense. Hr'g Tr. 10/26/09. On October 23, 2009, Defendant Mouzone had filed documents in anticipation of the hearing, including NATIONAL RESEARCH COUNCIL'S COMMITTEE ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES COMMUNITY, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 85-110, 127-82 (National Academies Press 2009) ("NRC Forensic Science Report");[8] Adina Schwartz, *A Systemic Challenge to the Reliability and Admissibility of Firearms and Toolmark Identification*, 6 COLUM. SCI. & TECH. L. REV. 2 (2005) ("Schwartz"); Alfred Biasotti, John Murdock, & Bruce R. Moran, *Scientific Issues*, *in* 4 MODERN SCIENTIFIC EVIDENCE 592-

[8] The National Research Council also published another report, BALLISTIC IMAGING (Nat'l Academies Press 2008), which is discussed *infra* and in *Glynn*, 578 F. Supp. 2d at 572 & nn.7-8, 573, 574. "NRC Forensic Science Report" refers to the 2009 report; "NRC Ballistic Imaging Report" refers to the 2008 report.

627 (2008-09); M.S. Bonfanti & J. De Kinder, *The influence of manufacturing processes on the identification of bullets and cartridge cases—a review of the literature*, SCIENCE & JUSTICE 39(1): 3-10 (1999) ("Bonfanti"); and Professor Schwartz's curriculum vitae. Paper No. 694, Ex. 1, 4-8 (Paper Nos. 694-2, 694-5 – 694-9). The Defense also submitted a series of additional exhibits at the hearing, including: Alfred A. Biasotti & John Murdock, "*Criteria for Identification" or "State of the Art" of Firearm and Toolmark Identification*, 16(4) AFTE JOURNAL 16-34 (1984), Ex. 4; *Standardization of Comparison Documentation*, 38(1) AFTE JOURNAL 72-73 (2006); and Detroit Police Department Firearms Unit: Preliminary Audit Findings as of September 23, 2008, Ex. 5. Despite the offering of these exhibits on the eve of the hearing and at the hearing, all were received as part of the record. Hr'g Tr. 10/26/09.

A. Firearm Toolmark Identification Evidence

The evidence that Defendant Mouzone seeks to suppress is expert testimony regarding identifications of toolmarks made by a firearm. A toolmark is a mark "generated when a hard object (tool) comes into contact with a relatively softer object," such as the marks that result "when the internal parts of a firearm make contact with the brass and lead that comprise ammunition." NRC Forensic Science Report at 150. A firearm's internal components include the barrel, the chamber, the breech face, the firing pin, the extractor, and the ejector, and these components have "'individual characteristics'" that result from manufacturing processes such as "'cutting, drilling, grinding, hand-filing, and, very occasionally, hand-polishing.'" *Monteiro*, 407 F. Supp. 2d at 359 (citation omitted). Most "individual characteristics" on a spent bullet stem from the process that renders a gun barrel from a piece of solid steel:

> A first step of the process, drilling, results in a comparatively rough hole of uniform diameter extending from one end of the barrel to the other. Next the barrel is bored with a reamer, designed to produce as smooth a surface as possible

> on the inside of the barrel. The interior surface or bore bears numerous scars and scratches from this drilling process; it is these random imperfections—more so than subsequent steps—that are said to account for individual characteristics on fired bullets.
>
> Barrels [usually] are further subjected to a rifling process, creating a pattern of grooves on the inside the barrel.[9] . . . [T]he bullet impacts with the barrel rifling and is given a rotation . . . that gives the bullet a more direct flight. . . . The rifling may be created by forcing a carbide button through the reamed barrel; it is the normal wear on this button, as many riflings are performed, that is said to impart individual microscopic variability in markings in the barrel (along with residual scars or imperfections from the original drilling).

NATIONAL RESEARCH COUNCIL'S COMMITTEE TO ASSESS THE FEASIBILITY, ACCURACY AND TECHNICAL CAPABILITY OF A NATIONAL BALLISTICS DATABASE, BALLISTIC IMAGING 31 (Nat'l Academies Press 2008) ("NRC Ballistic Imaging Report") (citations omitted).

The NRC Ballistic Imaging Report also defined the other components of a firearm and described their interactions with each other and the ammunition:

> The rear section (away from the muzzle) of the barrel bore is known as the chamber; it is designed and sized to fit a specific caliber of cartridge. The part of the firearm against which a cartridge sits when it is placed in the chamber is the breech, and the whole assembly may be referred to as the breechblock or breech bolt.
>
> The specific surface of the breech that makes contact with the base of the cartridge is the breech face . . . . The exact steps used to form the breech assembly can vary by manufacturer, and the breech face may vary in terms of the amount of filing or polishing done on it and whether any paint or other materials is applied to it. Basic filing can create gross striation marks in linear arrangements; in others, a rotary milling operation may be applied to the breech face surface, creating a pattern of concentric circles. These steps are crucial to the theory of firearms identification as it is random imperfections created in these machining and filing processes that is said to make the surface (and the negative impressions of said surface, left on fired cartridge casings) unique.
>
> A hole drilled through the breech assembly holds the firing pin, a very hard steel rod that can be forced to protrude from the breech to strike the primer of a cartridge seated in the chamber. While most firing pins have a small rounded

[9] The raised surfaces between the "grooves" of a gun barrel are referred to as "lands." *Diaz*, 2007 WL 485967, at *1.

> end or nose, some have more distinctive shapes . . . . Firing pins are generally made on a standard screw machine. Like the breech face, the tip of the firing pin is subject to machining and filing steps that impart microscopic imperfections.
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> * * *
>
> Both revolvers and pistols make use of an extractor, typically a small arm that fits over the rim of the cartridge. As the name implies, the extractor serves to pull a spent cartridge from the chamber so that a new cartridge can take its place. In a revolver, the extractor—which can remove all cartridges simultaneously by depressing the ejection rod (or extractor rod)—also has ratchet notches that advance the cylinder to the next chamber. In a semiautomatic pistol, however, the extractor removes the cartridge so that it makes contact with the ejector, typically a fixed protuberance that strikes the rim of the cartridge. Because these steps are performed very quickly, and with some speed and force, both the extractor and ejector mechanisms can leave marks on expended cartridge casings.

Id. at 32-35 (citations and internal cross references omitted).

To be sure, mass production of guns has replaced hand-manufacturing, and "guns are mass-produced with even greater precision." *Glynn*, 578 F. Supp. 2d at 572. Nonetheless, "the final step in production of most firearm parts requires some degree of hand-filing which imparts individual characteristics to the firearm part." *Monteiro*, 407 F. Supp. 2d at 359.

In *Monteiro*, Judge Saris explained how these components and their characteristics cause toolmarks on bullets and cartridge casings:

> When a round (a single "shot") of ammunition is fired from a particular firearm, the various components of the ammunition come into contact with the firearm at very high pressures. As a result, the individual markings on the firearm parts are transferred to the ammunition. The ammunition is composed primarily of the bullet and the cartridge case. The bullet is the missile-like component of the ammunition that is actually projected from the firearm, through the barrel, toward the target. . . . The cartridge case is the part of the ammunition situated behind the bullet containing the primer and propellant, the explosive mixture of chemicals that causes the bullet to be projected through the barrel. In the case of a semi-automatic handgun, once a round of ammunition is loaded into the chamber, and the gun is cocked, the shooter pulls the trigger, and the firing pin is released. The

> firing pin strikes the back of the cartridge case, igniting the primer in the ammunition, thus starting a chemical reaction, leading to
>
> > the bullet being pushed down the barrel by the expanding gases. These gases also exert an equal and opposite force on the cartridge case which forces the slide and breechblock to the rear. This ejects the spent cartridge case through a port in the side, or occasionally top, of the slide.
> >
> > During this process, which occurs in a fraction of a second, the cartridge case comes into contact with several parts of the firearm, most notably the firing pin, as explained above, and the breech face, a flat surface behind the cartridge case against which the cartridge case is pushed by the expanding gases. When the cartridge case is "slammed into the standing breech face," some of the individual toolmarks left on the breech face in the manufacturing process are replicated on the surface of the cartridge case. These toolmarks are referred to as "impressed" toolmarks. Other marks might be left on the ammunition when parts of the firearm, like the firing pin, the extractor, or the ejector, are moved across the cartridge case, and these are referred to as "striated" toolmarks.

Id. at 359-60 (citations omitted); *see Diaz*, 2007 WL 485967, at *1-2; NRC Ballistic Imaging Report at 30-51; BRIAN J. HEARD, HANDBOOK OF FIREARMS AND BALLISTICS 127 (1997). In addition, "the inner barrel of the gun imparts 'rifling' on the bullet." Specifically, the lands make "depressed 'land impressions'" and the grooves make "raised 'groove impressions.'" *Diaz*, 2007 WL 485967, at *1. And, there is a left or right "twist imparted on a bullet . . . , depending on the direction of the lands and grooves." *Id.*

Firearm toolmarks are associated with a weapon's class, subclass, and individual characteristics. *Monteiro*, 407 F. Supp. 2d at 360; NRC Forensic Science Report at 152. Class characteristics are "'family resemblances which will be present in all weapons of the same make and model.'" *Monteiro*, 407 F. Supp. 2d at 360. Examples of class characteristics include the bullet's weight and caliber; number and width of the lands and grooves in the gun's barrel; and the "twist" (direction of turn, i.e., clockwise or counterclockwise, of the rifling in the barrel).

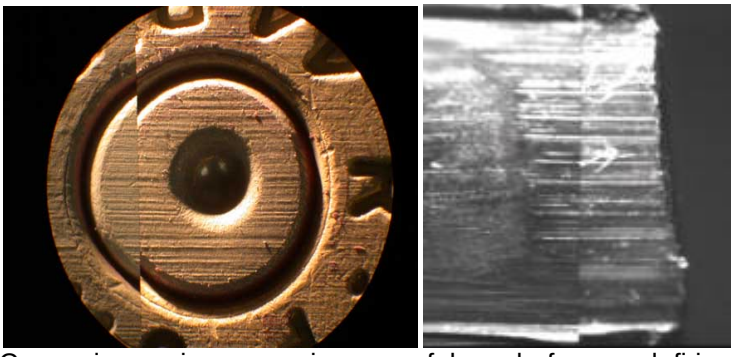
Diaz, 2007 WL 485967, at *2. Class characteristics that cause toolmarks on spent cartridge casings include the "caliber, type of breech face, and type of firing pin." *Id.* A breech face may be "parallel, arched, smooth, granular, or circular," and a firing pin can leave an impression that is "circular, rectangular, [or] elliptical." *Id.*

Subclass characteristics "are 'produced incidental to manufacture' and 'can arise from a source which changes over time,' and therefore "may be present on a group of guns within a certain make or model, such as those manufactured at a particular time and place." *Monteiro*, 407 F. Supp. 2d at 360; *Diaz*, 2007 WL 485967, at *2; *see* NRC Ballistic Imaging Report, *supra*, at 58 (defining subclass characteristics as having three characteristics: they are "'[p]roduced incidental to manufacture'"; (2) "'they relate to a small group source,'" i.e., "'a subset of the class to which they belong'"; and (3) they "'[c]an arise from a source which changes over time'") (citation omitted). An example would include imperfections "on a rifling tool that imparts similar toolmarks on a number of barrels before being modified either through use or refinishing." Ronald G. Nichols, *Defending the Scientific Foundations of the Firearms and Tool Mark Identification Discipline: Responding to Recent Challenges*, 52 J. FORENSIC SCI. 586, 587 (2007) ("Nichols").

Individual characteristics are "'[r]andom imperfections produced during manufacture or caused by accidental damage . . . which are unique to that object and distinguish it from all others." *Monteiro*, 407 F. Supp. 2d at 360; *see Diaz*, 2007 WL 485967, at *2. However, non-unique marks may comprise individual characteristics, and wear and tear cause individual characteristics to change over time to some extent. *Monteiro*, 407 F. Supp. 2d at 360-61. Thus, the toolmarks made on a bullet or cartridge casing include marks imposed by all weapons of the make and model that fired the ammunition (class characteristics), marks common only to a

subset of that make and model (subclass characteristics), and marks unique to the weapon that fired the ammunition (individual characteristics). *Id.* Sgt. Ensor testified that firearms toolmark examiners will not declare a "match" based on class characteristics, and they endeavor not to make a match based on subclass characteristics. Instead, they seek to make a match only on individual characteristics.

At the base of firearms identification is the theory that, based on correspondence among toolmarks, a firearms examiner can discern matches among bullets, cartridge casings, and their weapon of origin "[b]y using a 'comparison microscope' to compare ammunition test-fired from a recovered gun with spent ammunition from a crime scene." *Monteiro*, 407 F. Supp. 2d at 359; *see Diaz*, 2007 WL 485967, at *3; NRC Forensic Science Report at 153; *see also Glynn*, 578 F. Supp. 2d at 572 ("Firearm and toolmark analysis rests on the twin assumptions that the surface contours of every gun are unique and that, every time that gun is fired, some of those unique markings, along with markings caused by the act of firing itself, are transferred to the shell casing and bullet, leaving distinctive patterns on each of them.").



Comparison microscope images of breech face and firing pin marks on a cartridge (l) and rifling marks on a bullet (r). Courtesy of Maine State Police Crime Lab.

The process for subjective traditional pattern matching—the pervasive method of ballistic toolmark analysis, *see Diaz*, 2007 WL 485967, at *9—is as follows:

> [A] firearms examiner presented with a handgun and spent cartridge cases will test fire the weapon using the same type of ammunition as that recovered in the case. The examiner will look at the test-fired cartridge cases and the recovered cartridge cases simultaneously using an instrument called a comparison microscope, which is necessary to overlay the images of the two shell casings. First put into use in 1925, the comparison microscope allows the examiner to compare the tiny markings left on the two cartridge cases. In theory, if the test cartridges and recovered cartridges were fired from the same gun, the examiner would see sufficient patterns of matching marks, supposedly leading to "a result as conclusive as fingerprints."

Monteiro, 407 F. Supp. 2d at 361; *see* JULIAN S. HATCHER, FRANK J. JURY & JAC WELLER, FIREARMS INVESTIGATION, IDENTIFICATION, AND EVIDENCE 15 (2d ed. 1957) (identified in *Monteiro*, 407 F. Supp. 2d at 368 as "the leading treatise in the field"). The examiner may reach one of three conclusions:

> The examiner can make: (1) an "identification" of the components, concluding that they came from the same source; (2) an "elimination" of the components, concluding that they did not come from the same source; and (3) "inconclusive," meaning that there is not enough evidence to identify whether the components either do or do not come from the same source. In the parlance of firearm examiners, if there is sufficient agreement to make an identification, a firearm examiner often states that the chance that another firearm could have made the mark is a "practical impossibility."

Diaz, 2007 WL 485967, at *3.

"A perfect correspondence between the lines on a test-fired cartridge and the evidence recovered from the scene is impossible; in the real world, there is no such thing as a 'perfect match.'" *Monteiro*, 407 F. Supp. 2d at 362 (quoting Alfred A. Biasotti, *A Statistical Study of the Individual Characteristics of Fired Bullets*, 4 J. FORENSIC SCI. 34, 44 (1959) ("Biasotti: 1959") (noting the "erroneous conception of a 'perfect match' which is actually only a theoretical possibility and a practical impossibility")). Indeed, Biasotti's 1959 study revealed that "only 21-38 percent of the marks will match up on bullets fired from the same gun." *Id.* at 362. The

significance of that figure comes to light when it is noted that a correspondence between 15-20 percent of the marks of "bullets fired by two different .38 special Smith & Wesson revolvers of the same make and model" has been observed. *Id.*; *see Diaz*, 2007 WL 485967, at *12 ("According to Schwartz, Biasotti found that there was a 15-24% overlap in matching striae between bullets fired from different guns.").

Thus, according to the AFTE, a match exists "when the unique surface contours of two toolmarks are in 'sufficient agreement.'" *Monteiro*, 407 F. Supp. 2d at 363 (quoting *Theory of Identification*, 30 AFTE J. 86, 86 (1998) ("*AFTE Theory*")); *see Glynn*, 578 F. Supp. 2d at 571-72; NRC Forensic Science Report at 153. "Sufficient agreement" is defined in terms of "'the significant duplication of random toolmarks,'" and "'[a]greement is significant when it exceeds the best agreement demonstrated between tool marks known to have been produced by different tools and is consistent with the agreement demonstrated by tool marks known to have been produced by the same tool.'" *Monteiro*, 407 F. Supp. 2d at 363 (quoting *AFTE Theory* at 86). Put another way, among those who subscribe to the AFTE theory of toolmark identification, "[t]he statement that 'sufficient agreement' exists between two toolmarks means that the likelihood that another tool could have made the mark is so remote as to be considered a practical impossibility." *Id.* (quoting *AFTE Theory* at 86); *see* Nichols, *supra*, at 589.

The AFTE acknowledges that "'the interpretation of individualization/identification is subjective in nature, founded on scientific principles and based on the examiner's training and experience.'" *Monteiro*, 407 F. Supp. 2d at 363 (quoting *AFTE Theory* at 86). At the hearing, Sgt. Ensor agreed that the interpretation of observed characteristics by a toolmark examiner is a subjective process. Hr'g Tr. 10/26/09. Agreeing that it "is largely a subjective determination," *Monteiro*, 407 F. Supp. 2d at 355, the *Monteiro* court elaborated: "This conclusion is not based

on any quantitative standard for how many striations or marks need to match or line up. Instead, it is based on a holistic assessment of what the examiner sees." *Id.* at 364. In *Glynn*, the court observed that the requirement that "sufficient agreement" must exist for an examiner to declare a match "is inherently vague," and "ballistics opinions are significantly subjective." [10] 578 F. Supp. 2d at 572; *cf. Diaz*, 2007 WL 485967, at *1, 8 ("the standards and criteria for traditional pattern matching are subjective," but "it is the subjective judgment of trained professionals with a keen practiced eye for discerning the extent of matching patterns"). The subjective evaluation leaves substantial latitude in reaching conclusions. [11] Indeed, the AFTE's most ardent supporter, Ronald Nichols of the Bureau of Alcohol, Tobacco, Firearms and Explosives Laboratory Services ("ATF Bureau"), San Francisco, acknowledges the subjective component of toolmark examiners undertaking to discern "sufficient agreement" in a toolmark identification, stating that

[10] The term "ballistics" is a misnomer if used to describe bullet or cartridge identification. "Ballistics is the study of flying projectiles, including bullets. Toolmark analysis, the technique used in this case, involves the study of marks made by tools, such as the marks a gun imprints on bullets or shell casings." *United States v. Green*, 405 F. Supp. 2d 104, 118 (D. Mass. 2005).

[11] Because the traditional approach of pattern matching lacks an objective standard, some firearms examiners rely instead on an approach involving consecutively matching striae ("CMS"). *Monteiro*, 407 F. Supp. 2d at 370. "CMS is an attempt to eliminate some of the subjectivity of firearms identification by using an 'objective' consideration of 'matching striae' to "add some quantification to an examination so that there is some numerical and statistical data to support an examiner's conclusion of an identification." *Diaz*, 2007 WL 485967, at *3. Under CMS, examiners look at "runs" of striae, i.e., groups of closely aligned striae on a bullet, and they consider the number of consecutive striae that match between bullets. *Monteiro*, 407 F. Supp. 2d at 370. (CMS is not applied to cartridge casings. *Diaz*, 2007 WL 485967, at *3.) Correspondence between one 6-line run of striae or two 3-line runs of striae permits an identification. *Monteiro*, 407 F. Supp. 2d at 370. CMS analysis has yet to be adopted by a majority of toolmark examiners, however. "Although CMS is a widely accepted protocol which has been scientifically validated, it is not the predominant standard in the field according to AFTE." *Id.* Further, "[t]o the critics, CMS necessarily involves some subjectivity" because an examiner must "count points of identification and . . . different examiners might count points differently." *Diaz*, 2007 WL 485967, at *12. Sgt. Ensor testified that CMS was not used as a method of making the identification at issue in this case, and that CMS is not generally used by most firearms toolmark examiners. Hr'g Tr. 10/26/09.

"there is no universal agreement as to how much correspondence exceeds the best-known nonmatching situation." Nichols, *supra*, at 589.

In an effort to bridge the gap in this subjective process to bolster findings of "sufficient agreement," the AFTE "established standards for intellectual rigor" and accepted methodology mandate (1) the "documentation of the reasons for concluding there is a match" in a particular examination (including, where appropriate, diagrams, photographs or written descriptions), and (2) the "peer review" (more accurately viewed as obtaining a second opinion from another qualified firearms and toolmark examiner on a match that has been found) of the primary examiner's conclusion by a second examiner. *See Monteiro*, 407 F. Supp. 2d at 355; *Diaz*, 2007 WL 485967, at *5; Hatcher, *supra*, at 383, 445. The AFTE standard provides:

> The case record must contain documentation of the observations that serve as the basis for a reported conclusion. Laboratories are afforded latitude in establishing how this should be accomplished. At a minimum, the documentation must include interpretable depictions or descriptions of the agreement or disagreement of individual and/or class characteristics to the extent that another qualified firearm and toolmark examiner, without the benefit of the evidence itself, can review the case record, understand what was compared, and evaluate why the examiner arrived at the reported conclusion. . . . The case record must clearly describe or label what items are depicted.

Standardization of Comparison Documentation, *supra*, at 72-73. Sgt. Ensor testified that photographs suffice for "interpretable depictions or descriptions of the agreement." Hr'g Tr. 10/26/09.

Indeed, when, as with firearms toolmark identification, admissibility of the examiner's opinion as to the existence of a match is predicated on the examiner's experience, it is essential that the examiner provide a sufficient explanation for the basis of the opinion. As noted by the Advisory Committee Note to Fed. R. Evid. 702:

> If the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts. The trial court's gatekeeping function requires more than simply "taking the expert's word for it."

The twin requirements of adequate documentation and peer review of the primary examiner's results are said to "ensure the reliability of the expert's results and the testability of the opinion." *Monteiro*, 407 F. Supp. 2d at 355; *see United States v. Crisp*, 324 F.3d 261, 269 (4th Cir. 2003) (citing "peer review . . . and double checking" among factors establishing "uniform standards" and weighing in favor of admission of fingerprint evidence as reliable). Without them, courts that have gone the farthest in undertaking an analysis of the reliability of firearms toolmark identification methodology have been reluctant to admit such evidence. *See, e.g.*, *Monteiro*, 407 F. Supp. 2d at 374 (excluding opinions of firearms examiner who failed to document the basis for his findings, and failed to subject them to peer review).

In the words of a firearms toolmark examiner:

> [F]or our work to be valid, it must be verifiable to other examiners. This means that other examiners must be able to repeat the work and come to the same conclusions. Therefore, the data that we gather should provide a well-defined "roadmap" as to what experiments we performed to answer the question(s) posed, what data was gathered, and a clear demonstration of the evidence from which we supported our conclusion(s). This mechanism of communication among scientists is a substantial part of the process of verification.

Id. at 368 (quoting Bruce Moran, *Photo Documentation of Toolmark Identifications-An Argument in Support*, 35 AFTE J. 174, 181 (2003) and noting that the Government's expert, an operations officer for the forensic laboratories at the ATF Bureau, concurred); *see* AMERICAN SOCIETY OF CRIME LABORATORY DIRECTORS, LABORATORY ACCREDITATION BOARD MANUAL 29 (1997) (stating that "documentation to support conclusions must be such that in the absence of

the examiner, another competent examiner or supervisor could evaluate what was done and interpret the data"); Hatcher, *supra*, at 445 (stating that "firearms expert must not only do his work meticulously, accurately, and efficiently; he must also report his findings in the same manner"). Sgt. Ensor acknowledged during his testimony that the documentation of an examiner's findings as well as the review of match results by another examiner were essential components of the proper methodology required by the AFTE theory.

B. Legal Framework for Determining the Admissibility of Toolmark Identification Evidence

The Federal Rules of Evidence charge the district court with determining "[p]reliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence," Fed. R. Evid. 104(a), such as the question of admissibility under Fed. R. Evid. 702. The Court must "ensur[e] that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." *Daubert v. Merrell Dow Pharms.*, 509 U.S. 579, 597 (1993). Rule 702 provides indicia of reliability for the district court to consider: "(1) [whether] the testimony is based upon sufficient facts or data, (2) [whether] the testimony is the product of reliable principles and methods, and (3) [whether] the witness has applied the principles and methods reliably to the facts of the case." To be admissible under Rule 702, in addition to being reliable, testimony must be relevant, helpful, and "fit":

> Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful. An additional consideration under Rule 702—and another aspect of relevancy—is whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute. The consideration has been aptly described . . . as one of "fit."

Daubert, 509 U.S. at 591.

As explained in *Daubert*, a district court assesses whether proffered scientific, specialized, or technical evidence meets the requirements of relevance, reliability, helpfulness, and fit by considering five non-exclusive factors: (1) "whether a theory or technique . . . can be (and has been) tested"; (2) "whether the theory or technique has been subjected to peer review and publication"; (3) "the known or potential rate of error"; (4) "the existence and maintenance of standards controlling the technique's operation"; and (5) whether the theory or technique has gained "'general acceptance'" in the "relevant scientific community." *Id.* at 593-94 (citation omitted). However, the Supreme Court emphasized that the inquiry was "flexible," with a "focus . . . on principles and methodology, not on the conclusions that they generate." *Id.* at 594-95; *see Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999) ("*Daubert*'s list of specific factors neither necessarily nor exclusively applies to all experts or in every case."). Also, "while the basic requirements of reliability—as they are now articulated in Rule 702—apply across the board to all expert testimony, the more particular standards for scientific evidence need not be met when the testimony offered does not purport to be 'science.'" *Glynn*, 578 F. Supp. 2d at 570 (citing *Kumho Tire*, 526 U.S. at 151-52).

The *Daubert* factors apply to established and novel theories and techniques alike, although "well-established propositions are less likely to be challenged than those that are novel, and they are more handily defended." *Daubert*, 509 U.S. at 592 n.11. Nonetheless, federal courts, almost without exception, have admitted toolmark evidence, often without applying the *Daubert* factors. *See Glynn*, 578 F. Supp. 2d at 569 ("[F]or many decades ballistics testimony was accepted almost without question in most federal courts in the United States."); *Monteiro*, 407 F. Supp. 2d at 364 (characterizing prior admissions of toolmark identification testimony as "semi-automatic," although ruling that a particular examiner could not testify for failure to

document his findings or have his conclusions reviewed); *United States v. Santiago*, 199 F. Supp. 2d 101, 111 (S.D.N.Y. 2002) (noting that the "Court has not found a single case in [the Second] Circuit that would suggest that the entire field of ballistics identification is unreliable"; declaring that "the Supreme Court's decisions in *Daubert* and *Kumho Tire*, did not call this entire field of expert analysis into question"). *See also United States v. Hicks*, 389 F.3d 514, 526 (5th Cir. 2004) ("[T]he matching of spent shell casings to the weapon that fired them has been a recognized method of ballistics testing in this circuit for decades."); *Taylor*, 2009 WL 3347485, at *9 (concluding that "firearms identification testimony is admissible under Rule 702 and *Daubert*");[12] *United States v. Pugh*, No. 08-cr-00130, 2009 WL 2928757, at *9-10 (S.D. Miss. 2009) (concluding that expert testimony on firearm toolmark identification was properly admitted because "[m]atching spent shell casings to the weapon that fired them is a recognized method of ballistics testing" and "firearm comparison testing has widespread acceptance in [the Fifth] Circuit"); *Diaz*, 2007 WL 485967, at *5 (Firearm toolmark identification testimony "'is admissible in every American jurisdiction. At least 37 jurisdictions have approved it by appellate opinion.' . . . No reported decision has ever excluded firearms-identification expert testimony under *Daubert*."); *United States v. Foster*, 300 F. Supp. 2d 375 (D. Md. 2004) (noting "the general reliability of the science of ballistics"; that "[b]allistics evidence has been accepted in criminal cases for many years"; and that "[i]n the years since *Daubert*, numerous cases have

[12] In another Memorandum Opinion and Order issued in *United States v. Taylor*, No. CR 07-1244 (D.N.M. Sept. 30, 2009) (unpublished), the court granted the Government's motion to exclude Schwartz's expert testimony at trial (while allowing it at the hearing) because the court found that Professor Schwartz was "not a firearms examiner" and "not qualified by knowledge, skill, training, education, or any other means to give opinion testimony in which she disagrees (or agrees, for that matter) with the specific conclusions of the Government's firearms examiner." Slip op. at 5. Further, it "seriously question[ed] the reliability of her methodology." *Id.* at 13. Also, noting that it was not aware of "any case in which Dr. Schwartz was allowed to testify as an expert in front of a jury at trial," the court found that her trial testimony "would not be very helpful to the jury" and "would very likely confuse the jury." *Id.* at 12.

confirmed the reliability of ballistics identification"). *Cf. United States v. Green*, 405 F. Supp. 2d 104, 108 (D. Mass. 2005) (admitting evidence despite "serious reservations" because "*every single court* post-*Daubert* has admitted this testimony, sometimes without any searching review") (emphasis in *Green*). *But see Sexton v. State*, 93 S.W.3d 96, 101 (Tex. Crim. App. Ct. 2002) (concluding that district court erred in allowing testimony regarding toolmark identification of *unfired* cartridge casings because government failed to establish reliability, even though "underlying theory of toolmark examination could be reliable in a given case"); *Ramirez v. State*, 810 So. 2d 836, 849 (Fla. 2001) (finding inadmissible under *Frye* expert toolmark testimony identifying match with "absolute certainty" but lacking "the hallmarks of acceptability that apply in the relevant scientific community to this type of evidence").

Recent cases reflect concerns about the admissibility of firearm toolmark identification testimony. In *United States v. Williams*, 506 F.3d 151 (2d Cir. 2007), while concluding that the Government's firearms identification expert's methodology "satisfied" *Daubert*, the Second Circuit cautioned that its opinion should not "be taken as saying that any proffered ballistic expert should be routinely admitted." *Id.* at 161. It noted that *Daubert* did not "'grandfather' or protect from *Daubert* scrutiny evidence that had previously been admitted under *Frye* [*v. United States*, 293 F. 1013 (1923)]." *Id.* at 162. The *Williams* Court explained that past acceptance does not render expert testimony admissible; rather, "expert testimony long assumed reliable before Rule 702 must nonetheless be subject to the careful examination that *Daubert* and *Kumho Tire* require." *Id.* Given the publication of the NRC Forensic Science Report in 2009 and the NRC Ballistic Imaging Report in 2008—two reports (discussed *infra*) which I find to be particularly credible in evaluating the scientific status, *vel non*, of firearms toolmark identification methodology— I find particularly compelling the caveat expressed by the *Williams*

Court not to "grandfather" admissibility of evidence merely because it has been universally admitted in the past.

In *Green*, 405 F. Supp. 2d 104, the court also acknowledged that district courts are "obliged to critically evaluate toolmark and ballistics evidence, even though it has been accepted for years pre-*Kumho*," because failure "to do so would be equivalent to 'grandfathering old irrationality.'" *Id*. at 118 (footnote and citation omitted). The *Green* court warned: "The more courts admit this type of toolmark evidence without requiring documentation, proficiency testing, or evidence of reliability, the more sloppy practices will endure; we should require more." *Id.* at 109. Further, it observed that "recent reexaminations of relatively established forensic testimony have produced striking results," such as that "forensic testing errors were responsible for wrongful convictions in 63%" of the cases in one study. *Id.* at 109 n.6.

Nor have the courts been the only institution to acknowledge the growing concern regarding the reliability of long-accepted forensic methodology. In 2006, pursuant to a Congressional mandate, the National Academy of Sciences established a committee "'to conduct a study on forensic science,'" NRC Forensic Science Report, *supra*, at 2 (quoting P.L. No. 109-08, 119 Stat. 2290 (2005)), and the resulting report, published in 2009, heightens these concerns. The committee was charged with, *inter alia*, "'disseminat[ing] best practices and guidelines concerning the collection and analysis of forensic evidence to help ensure quality and consistency in the use of forensic technologies and techniques to solve crimes, investigate deaths, and protect the public.'" *Id*. (quoting S. Rep. No. 109-88, at 46 (2005)). It specifically addressed firearms examination, toolmarks, and "the use of forensic evidence in criminal . . . litigation," including "the manner in which forensic practitioners testify in court"; "cases

involving the misinterpretation of forensic evidence"; and "judges' handling of forensic evidence."[13] *Id*. at 3-4.

According to the NRC Forensic Science Report, other than nuclear DNA analysis "'no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source." *Id*. at 8. The NRC Forensic Science Report pointed out that toolmark identification tests "have never been exposed to stringent scientific scrutiny." *Id*. at 42. The Report noted that it is "challenging" for an examiner to determine "the extent of agreement in marks made by different tools, and the extent of variation in marks made by the same tool." *Id*. at 153. Moreover, it said that "these decisions involve subjective qualitative judgments by examiners," and "the accuracy of examiners' assessments is highly dependent on their skill and training," gained through "past casework" and/or "extensive training programs using known samples." *Id*. It emphasized that "the final determination of a match is always done through direct physical comparison of the evidence by a firearms examiner, not the computer analysis of images," and the examiner makes "a subjective decision based on unarticulated standards and no statistical foundation for estimation of error rates." *Id*. at 153-54.

> With regard to toolmark evidence, the NRC Forensic Science Report concluded:
>
> Because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a

[13] The Government contends that the NRC Forensic Science Report did not "take into account the holdings of the cases" admitting toolmark identification testimony, and that "the factors to be considered under *Daubert* take much more than precision and repetition into consideration." Gov.'s Opp'n 6. I disagree. *See* NRC Forensic Science Report at 107-08 & n.82 (discussing *Glynn*, *Monteiro*, *Green*, and *Diaz*, yet expressing concerns about the reliability of the methodology); NRC Ballistic Imaging Report at 83-84 (discussing *Monteiro*, *Green*, and *Diaz*, yet expressing concerns about the reliability of the methodology).

> given level of confidence in the result. Sufficient studies have not been done to understand the reliability and repeatability of the methods. The committee agrees that class characteristics are helpful in narrowing the pool of tools that may have left a distinctive mark. Individual patterns from manufacture or from wear might, in some cases, be distinctive enough to suggest one particular source, but additional studies should be performed to make the process of individualization more precise and repeatable.

Id. at 154. Moreover, it characterized the lack of a specific protocol for toolmark analysis as a "fundamental problem," reasoning that toolmark analysis guidance provided by the AFTE lacks specificity because it allows an examiner to identify a match based on "sufficient agreement," which the AFTE defines using the undefined terms "exceeds the best agreement" and "consistent with." [14] *Id*. at 155.

The NRC's earlier report, the NRC Ballistic Imaging Report, identified similar concerns. The National Research Council assembled a committee to determine whether a national ballistics database was feasible, and if so, whether it would be accurate and what its technical capabilities

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[14] Despite this pointed expression of concern by the NRC regarding a fundamental shortcoming in assessing the reliability of toolmark evidence, proponents of the AFTE methodology appear to be at a loss as to how to address it, other than by dismissing it. Indeed, the AFTE's most vocal supporter, Nichols of the ATF Bureau, attempts to address the NRC's concern about the lack of specificity in determining when "sufficient agreement" exists by acknowledging it ("there is no universal agreement as to how much correspondence exceeds the best-known nonmatching situation," Nichols, *supra*, at 589) but then attempting to minimize it ("in practice this limitation is not as significant as critics contend," *id.*). Nichols argues that adequate training of firearms examiners, coupled with routine proficiency testing, provide an acceptable counterbalance to the lack of standardization of the "sufficient agreement" approach. *Id.* at 589-90.

It would be easier to accept Nichol's assurances that periodic proficiency testing adequately will ensure against erroneous identifications if there were not so many concerns about the effectiveness of the proficiency test in preventing erroneous determinations of "sufficient agreement." (The exam is prepared by a private firm, Collaborative Testing Services ("CTS"), and it is the very proficiency test that Sgt. Ensor took and passed annually.) *See Monteiro*, 407 F. Supp. 2d at 367-68 (discussing the proficiency examination given to forensic firearms and toolmark examiners and raising questions of how difficult the test is ("in the 2005 CTS cartridge case examiners *none* of the 255 test takers nationwide answered incorrectly") and the conditions under which it is given (examiners know when they are being tested)) (emphasis in *Monteiro*). *See also* Schwartz, *supra*, at 24-28 (raising similar concerns).

would be. NRC Ballistic Imaging Report, *supra*, at 1-2. Characterizing firearm toolmark identification as "part science and part art form," *id.* at 55, the committee found that "[t]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated," *id.* at 3. While explaining that it was "stopping short of commenting on whether firearm toolmark evidence should be admissible," the committee said: "Conclusions drawn in firearms identification should not be made to imply the presence of a firm statistical basis when none has been demonstrated." *Id.* at 82. Further, it stated that "additional general research on the uniqueness and reproducibility of firearms-related toolmarks would have to be done if the basic premises of firearms identifications are to be put on a more sold scientific footing." *Id.* The committee concluded that a national ballistics database "of all new and imported guns is not advisable at this time." *Id.* at 5.

Thus, the current analytical framework requires consideration of both the broad issue of firearm toolmark identification testimony's admissibility *vel non* and the narrow issue of admissibility of the evidence in this case. Put another way, the Court must first determine whether expert testimony on toolmark identification is admissible under *Daubert*, *Kumho Tire*, and Rule 702. Then, in the event that this Court finds—as have all others before it that have addressed this issue—that such evidence is admissible in this case, I must determine whether Sergeant Ensor's testimony is admissible, based on his qualifications and methodology.

C. Admissibility of Expert Testimony on Firearms Toolmark Identification

In his famous essay, *Life on the Mississippi*, published in 1883, Mark Twain observed, archly, "There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact."[15]

Both technical publications and court decisions have suggested that the focus in considering the *Daubert* factors should be on whether firearm toolmark identification is a "science," and if so, whether its methodology will withstand rigorous scientific scrutiny. Although this debate has yet to be resolved (*compare* Schwartz, *supra*, *with* Nichols, *supra*), the latest scientific consensus is as expressed in the NRC Forensic Science Report. Discussing *Daubert*, 509 U.S. at 579, the NRC stated: "The law's greatest dilemma in its heavy reliance on forensic evidence, however, concerns the question of whether—and to what extent—there is *science* in any given forensic science discipline." NRC Forensic Science Report at 9 (emphasis in original). To be sure, the NRC observed that "*Kumho Tire* importantly held that Rule 702

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[15]

> Now, if I wanted to be one of those ponderous scientific people, and "let on" to prove what had occurred in the remote past by what had occurred in a given time in the recent past, or what will occur in the far future by what has occurred in late years, what an opportunity is here! Geology never had such a chance, nor such exact data to argue from! Nor "development of species," either! Glacial epochs are great things, but they are vague—vague. Please observe:
>
> In the space of one hundred and seventy-six years the Lower Mississippi has shortened itself two hundred and forty-two miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the Old Oölitic Silurian Period, just a million years ago next November, the Lower Mississippi River was upward of one million three hundred thousand miles long, and stuck out over the Gulf of Mexico like a fishing-rod. And by the same token any person can see that seven hundred and forty-two years from now the Lower Mississippi will only be a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesome returns of conjecture out of such a trifling investment of fact.

MARK TWAIN, LIFE ON THE MISSISSIPPI 155-56 (Harper & Bros. 1950) (1883).

applies to both scientific and nonscientific expert testimony." *Id*. at 10 n.15. But, as noted, the NRC focused principally on subjectivity as a pitfall for toolmark identification tests and cautioned that the methods "have never been exposed to stringent scientific scrutiny." *Id*. at 42.

Professor Schwartz argues that "firearms and toolmark identifications should be inadmissible across-the-board" because "similarities between toolmarks made by different tools and differences between toolmarks made by the same tool imply that a statistical question must be answered to determine whether a particular tool was the source of an evidence toolmark." Schwartz, *supra*, at 1; *see* Adina Schwartz, *Commentary on Ronald G. Nichols, Defending the Scientific Foundations of the Firearms and Tool Mark Identification Discipline: Responding to Recent Challenges, 52 J. FORENSIC SCI. 586, 586 (2007)*, 52 J. FORENSIC SCI. 1414 (2007). Professor Schwartz identifies "three major sources of misidentifications by firearms and toolmark examiners: (1) the individual characteristics of toolmarks are comprised of non-unique marks, (2) subclass characteristics shared by more than one tool may be confused with individual characteristics unique to one and only one tool, and (3) the individual characteristics of the marks made by a particular tool change over time." Schwartz, *supra*, at 4. She insists that "all firearms and toolmark identifications should be excluded until adequate statistical empirical foundations and proficiency testing are developed for the field." *Id.* at 1. Professor Schwartz's Affidavit and her testimony in this case rings of the sentiment that firearm toolmark identification is not a science because toolmark examiners have no reliable methods for determining whether different toolmarks were created by the same weapon. Aff. 9 ¶ 10; Hr'g Tr. 10/26/09. *See Glynn*, 578 F. Supp. 2d at 570 ("ballistics identification analysis . . . could not fairly be called 'science'").

While these critics of the science underlying ballistic toolmark analysis raise legitimate concerns about whether the process has been demonstrated to be sufficiently reliable to be called

a "science," the defenders of the process—and every federal court to have examined the issue in a written opinion (albeit with considerable differences in the amount of detail in the analysis)—have concluded that it is sufficiently plausible, relevant, and helpful to the jury to be admitted in some form. Nichols of the ATF Bureau asserts that "the discipline of firearms and tool mark identification is firmly rooted in the scientific method." Nichols, *supra*, at 586; *see* Ronald G. Nichols, Author's Response to Schwartz's Commentary, *supra*, 52 J. FORENSIC SCI. 1416 (2007); *Diaz*, 2007 WL 485967, at *13 ("There is a method and science behind firearm and toolmark identification."); *Monteiro*, 407 F. Supp. 2d at 365 ("Firearm identification evidence straddles the line between testimony based on science and experience. . . . Science is in the background, at the core of the theory, but its application is based on experience and training."). Even in *Glynn*, 578 F. Supp. 2d at 573, after determining that toolmark identification is not a science, the court said that the theory that "unique characteristics of each firearm are to an appreciable degree copied onto some or all bullets and casings fired from that gun . . . is both plausible and sufficiently documented by experience as to provide a good working assumption for most practical purposes." Accordingly, the *Glynn* court permitted the introduction of firearm toolmark identification, with some limitations. *Id.* at 570.

Professor Schwartz appears to be particularly pointed in her criticisms of courts for allegedly failing to "get it" that firearms toolmark identification is not science. *See* Schwartz, *supra*, at 33 ("Despite *Daubert*, no court has recognized the systemic scientific problems with firearms identification. Instead, courts have tended to wave away challenges to the reliability and admissibility of this type of testimony by pointing to its longstanding admission in court."). Her testimony at the hearing echoed these concerns. Hr'g Tr. 10/26/09. Professor Schwartz's criticism perhaps is understandable, given the courts' nearly uniform failure to share her view

that the methodology underlying the AFTE theory lacks scientific underpinnings. To date, the farthest that courts have been willing to go in excluding firearm toolmark identification evidence is to exclude testimony from individual firearms toolmark examiners who failed to document their conclusions or have them confirmed by another qualified examiner, *see Monteiro*, 407 F. Supp. 2d at 374, or to restrict the degree of certainty to which the examiners could express their identifications, *see Taylor*, 2009 WL 3346485, at *9 ("reasonable degree of certainty in the firearms examination field"); *Glynn*, 578 F. Supp. 2d at 570 ("more likely than not"); *Diaz*, 2007 WL 485967, at *11-12 ("reasonable degree of ballistic certainty"); *see also Monteiro*, 407 F. Supp. 2d at 355 (stating that appropriate standard is "reasonable degree of ballistic certainty"). And, in *United States v. Natson*, 469 F. Supp. 2d 1253, 1261-62 (M.D. Ga. 2007), the court concluded that the firearms and toolmark examiner's opinions were admissible, thereby implicitly, but not explicitly, condoning "100% degree of certainty."

However, even were courts widely to accept, as at least one (*Glynn*, 578 F. Supp. 2d at 570) has, that whatever firearms toolmark identification is, it is not "science," that would not presage the exclusion of all firearms toolmark identification evidence. That is because Rule 702 is not limited to admissibility of scientific evidence alone, but also governs "technical" or "specialized" evidence which, by necessity, does not meet the rigors of scientific analysis. *See Kumho Tire*, 526 U.S. at 141; *Taylor*, 2009 WL 3347485, at *3. Rule 702 permits introduction of technical or specialized evidence if it is given by qualified witnesses, based on sufficient facts, and produced through reliable methods that have been applied reliably to the facts of the case, so long as it is "helpful" to the jury's understanding of the case or will assist the jurors in making their factual determinations. Indeed, as Justice Scalia noted in his concurring opinion in *Kumho Tire*, the *Daubert* factors of testability, error rate, peer review, general acceptance, and adherence

to standards governing the methodology are relevant to determinations of admissibility under Rule 702, but they are not "holy writ." *Kumho Tire*, 526 U.S. at 159.

The more accurate characterization of what courts have done with regard to toolmark identification evidence, at least recently, is to recognize as the NRC Forensic Science Report clearly did, that if firearms toolmark evidence is characterized exclusively as "science," it has a long way to go before it legitimately can claim this status. As the ongoing skirmishes between Professor Schwartz and Nichols demonstrate, it is far from clear which view will prevail. Suffice it to say that the concerns expressed by the NRC ought to be heeded by courts in the future regarding the limits of toolmark identification evidence, and courts should guard against complacency in admitting it just because, to date, no federal court has failed to do so. *But see Monteiro*, 407 F. Supp. 2d at 374 (finding toolmark identification evidence admissible in general, but excluding a particular expert's testimony based on his failure to adhere to methodology). The more difficult task, but one which *Daubert*, *Kumho Tire*, and Rule 702 demand, is to determine whether, even if not fully grounded in scientific principles, toolmark identification evidence is sufficiently relevant, reliable, and helpful to a jury to be permitted as technical or specialized evidence. *See* Advisory Committee Note to Rule 702 ("The rule is broadly phrased. The fields of knowledge which may be drawn upon are not limited merely to the "scientific" and "technical" but extend to all "specialized" knowledge. Similarly, the expert is viewed, not in a narrow sense, but as a person qualified by "knowledge, skill, experience, training or education." Thus within the scope of the rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called "skilled" witnesses, such as bankers or landowners testifying to land values.").

And, as the *Taylor*, *Glynn*, *Diaz*, *Monteiro*, and *Green* courts have agreed, even with its increasingly obvious limitations, toolmark identification evidence is relevant, reliable, and helpful if offered (a) by a qualified examiner (b) who followed the AFTE theory (despite its subjectivity) and (c) who documents with notes, photographs, or sketches the conclusions reached in sufficient detail to permit (d) confirmation by a second qualified examiner of how an identification was reached (and, at trial, challenge by a defense expert if one has been engaged for this purpose), so long as (e) the examiner is prevented from making outlandish and unsupported pronouncements about the degree of certainty of his or her identification. To these limitations I would add another. To ensure that defense counsel can make any challenges to the admissibility of toolmark identification evidence and that courts may conduct hearings to resolve these challenges based on sufficient record, the Government should be required to strictly and timely comply with its Fed. R. Crim. P. 16 obligations regarding the opinions to be offered by firearms examiners in sufficient detail and sufficiently far in advance of motions deadlines or trials as to enable defense counsel to evaluate the conclusions and bases, determine whether to engage experts to test them, and if appropriate, challenge them.

While the future may bring greater scientific certainty to toolmark identification evidence (as the proponents of CMS predict) or, alternatively, prove once and for all that it is not scientifically reliable, at present it appears to be, with the foregoing safeguards in place, sufficiently reliable to be helpful to a jury. This is particularly true if defense experts have adequate access to the factual support for the Government toolmark examiner's opinions sufficiently far in advance of trial to be able to rebut or undermine the evidence and to enable a jury to have a balanced assessment of it and to decide what, if any, weight it deserves.

It is to be hoped, particularly if the Government properly lives up to its disclosure obligations under Fed. R. Crim. P. 16, that upon receipt of advance disclosure of toolmark identification evidence, defense counsel will be able to locate toolmark experts of their own. These experts, it is hoped, will be able to review the notes, photographs, and sketches underlying the Government's toolmark identification expert's opinion and, if necessary, perform their own independent study of the toolmark evidence itself. If the evidence is deficient, the defense experts will be able to enable the court to exclude the evidence, or the experts will be able to rebut it at trial. If so, then the adversary system will have lived up to its obligation to frame the factual disputes in a fashion that lay juries are equipped to resolve.

To summarize, several conclusions can be reached. First, as the NRC Ballistic Imaging Report made clear, despite the many studies conducted by toolmark examiners (*see* NRC Ballistic Imaging Report at 64-65, 70-75; Nichols, *supra*, at 588-89), to date, "[t]he validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated," NRC Ballistic Imaging Report at 81, and "[a]dditional general research on the uniqueness and reproducibility of firearms-related toolmarks would have to be done if the basic premises of firearms identification are to be put on a more solid scientific footing," *id.* at 82.

However, the NRC Ballistic Imaging Report stopped short of concluding that all firearms-related toolmark identification should be excluded as evidence in court, and it acknowledged that the research studies conducted to date have established a "baseline level of credibility" that toolmarks are not "so random and volatile that there is no reason to believe that any similar and matchable marks exist on two exhibits fired from the same gun." *Id.* at 81. Indeed, the NRC Ballistic Imaging Report agreed that "[t]he existing research, and the field's

general acceptance in legal proceedings for several decades, is more than adequate testimony to that baseline level." *Id.*

Second, federal courts that have conducted "*Daubert*" analyses on the admissibility of firearms-related toolmark identification evidence have attempted, with varying degrees of success, to apply the non-exclusive evaluative factors of testability, peer review and publication, error rate, general acceptance, and existence and maintenance of standards governing the methodology employed in making these identifications. *E.g.*, *Taylor*, 2009 WL 3347485, at *4-8; *Glynn*, 578 F. Supp. 2d at 570-74; *Montiero*, 407 F. Supp. at 366-72; *Green*, 405 F. Supp. 2d at 119-24.

While, on the existing record, it may be debatable whether it is "science," it clearly is technical or specialized, and therefore within the scope of Rule 702. Without repeating what these courts already have said, I find that the theory underlying firearms-related toolmark identification has gone through sufficient testing and publication of studies regarding its reliability and validity to establish a "baseline level of credibility" that sufficiently trained examiners may be able to identify "matchable marks" existing on bullets or cartridges and that these matches are relevant to determining whether the bullets or cartridges were fired from the same firearm. *See* NRC Ballistic Imaging Report at 81.

Much has been said about peer review. The theory behind peer review is that observation leads to commentary, and commentary exposes flawed methodology. Yet, there is a certain reverence that courts give to peer review that perhaps the scientific community does not share. Years before *Daubert*, the New England Journal of Medicine published the following candid assessment of the peer review process:

> [P]eer review is not and cannot be an objective scientific process, nor can it be relied on to guarantee the validity or honesty of scientific research, despite much uninformed opinion to the contrary. Its functions are more modest but nonetheless valuable . . . . [G]ood peer reviewed scientific journals should provide their readers with reports of the best available research, free of obvious major flaws. Still, although peer review can screen out work that is clearly invalid and improve the chances that published work is valid, it cannot guarantee scientific validity . . . . If peer review cannot guarantee the validity of research, still less can it be relied on to detect fraud.

A. Relman & M. Angell, *How Good Is Peer Review*, NEW ENGLAND J. OF MED., Sept 21, 1989, at 827. Put another way, peer review is important, but it has its own limitations. Nonetheless, the publication of *AFTE Journal* articles on firearm toolmark identification suggests that the theory has been subjected to peer review.

Additionally, I find that, despite its inherent subjectivity, the AFTE theory of firearms-related toolmark identification, which has as its primary objective the determination of whether "sufficient agreement" exists between examined bullets or cartridges to enable a toolmark examiner to conclude that there is a "match," has been generally accepted within the field of toolmark examiners, and that, despite the fact that there is "no universal agreement as to how much correspondence exceeds the best known nonmatching situation," Nichols, *supra*, at 589, the AFTE training courses and CTS proficiency testing (with all of its limitations) demonstrate the existence of standards governing the methodology of firearms-related toolmark examination to enable a properly trained examiner to provide in-court technical testimony that will be sufficiently reliable and helpful to a lay jury to assist the jurors in determining whether bullets or cartridges have been fired from a particular firearm, with two important qualifications.

First, as already stated, the conclusion expressed by a firearms toolmark examiner that a match exists is only as good as the underlying photographs, sketches, and notes that support it, and these materials are critical to ensuring that juries are able to learn of any deficiencies that

may exist at trial through effective cross-examination of Government toolmark identification witnesses, or testimony by defense rebuttal witnesses. For this reason, where a defendant has made a timely demand pursuant to Fed. R. Crim. P. 16(a)(1)(G) for a written summary of any testimony the Government intends to offer regarding firearms-related toolmark identification, the summary is useless if not accompanied by "bases and reasons" that support it. And, with regard to firearms toolmark identification, that includes the sketches, diagrams, notes, and photographs that the accepted methodology for application of the AFTE theory requires that the firearms examiner make.

Second, and of critical importance, I find that firearms toolmark identification evidence is only relevant, reliable, and helpful to a jury if it is offered with the proper qualifications regarding its accuracy. As the NRC Ballistic Imaging Report helpfully noted, "firearms examiners may often express their findings in bold absolutes—matches made to the same gun, to the exclusion of all other firearms in the world . . . ." NRC Ballistic Imaging Report at 67. There is an inherent bias underlying this tendency because "[i]f a firearms examiner is impeached through the *voir dire* process, his or her ability to testify in other cases can be severely affected; being associated with an error or misidentification can tarnish reputations." *Id.*

From my reading of the many published studies, journal articles, and cases referenced in this Report and Recommendation, it appears that the best that the AFTE theory can offer a jury is the conclusion that the matches between the bullets or cartridges at issue exceed the number of matches between bullets or cartridges known to have been fired from different firearms, and that the matches are "consistent with" (an inherently ambiguous standard for which there is no agreement as to how much correspondence must be shown, Nichols, *supra*, at 589) matches between bullets or cartridges known to have been fired from the same firearm. And, as noted in

the NRC Ballistic Imaging Report, respected studies have shown that "the average percent match for bullets from the same gun is low and the percent match for bullets from different guns is high." NRC Ballistic Imaging Report at 65 (quoting A.A. Biasotti: 1959, *supra*, at 37-44).

When it is reduced to its essentials, the "sufficient agreement" conclusion can hardly be regarded as an absolute identification, as even its most ardent supporters must concede. *See* Nichols, *supra*, at 590 ("The AFTE Theory of Identification . . . does not make claims of absolute identification."). Yet, astonishingly, the AFTE theory purports to demonstrate that once "sufficient agreement" has been found by one examiner, "the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility." *Id.*

Based on the materials that I have reviewed and the testimony at the hearing, I find that there is no meaningful distinction between a firearms examiner saying that "the likelihood of another firearm having fired these cartridges is so remote as to be considered a practical impossibility" and saying that his identification is "an absolute certainty." Neither is justified based on the testimony at the hearing or the literature and cases reviewed and discussed in this Report and Recommendation, and neither is warranted by the facts of this case.

Moreover, I agree with the courts in *Taylor*, 2009 WL 3347485, at *9; *Glynn*, 578 F. Supp. 2d at 570; *Monteiro*, 407 F. Supp. 2d at 355; *Diaz*, 2007 WL 485967, at *11-12; and *Green*, 405 F. Supp. 2d at 108-09, that firearms and toolmark examiners must be restricted in the degree of certainty with which they express their identification opinions. Given Sgt. Ensor's testimony at the hearing, I am reluctant to recommend that he be permitted to testify that he holds his amended identification opinion to "a reasonable degree of ballistic or technical certainty." *See Monteiro*, 407 F. Supp. 2d at 355; *Diaz*, 2007 WL 485967, at *11-12; *see also*

Taylor, 2009 WL 3347485, at *9 ("reasonable degree of certainty in the firearms examination field").

During cross examination, Sgt. Ensor testified that his own personal examination of various cartridges and bullet fragments, which were confirmed by another qualified examiner in his own lab, led him to look for matches to those bullet components among firearm evidence gathered in connection with other criminal investigations. Hr'g Tr. 10/26/09. He scanned the images of the evidence examined by his lab into the National Integrated Ballistic Identification System (IBIS), which printed out a long list of possible matches with evidence reviewed by other labs in other criminal investigations. *Id.* Among the matches were a series of cartridges examined by firearms toolmark examiners in Baltimore City Case No. 9335, dealing with a homicide. *Id.* He testified that he then undertook to compare some, but not all, of the cartridges in this case, Baltimore County Case No. 1496, with some, but not all, of the cartridges examined by the Baltimore City toolmark examiner.[16] *Id.* Based on this limited physical examination of the Baltimore City evidence, Sgt. Ensor reached one of the conclusions expressed in his September 27, 2007 Amended Report (Report 2), namely:

> Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12 and Q13 (cartridge cases) from Baltimore City Police CC#062K09335 ("Homicide") were fired in the same unknown firearm as QC-2, QC-3 and QC-4 in this case.

Aff., Ex. B.

Reading Report 2, it is impossible to appreciate that Sgt. Ensor and his colleagues did not personally compare all the cartridges in Case No. 1496 against all of the cartridges in Case No. 9335. Beyond the limited physical examination he did make of the evidence in the City Case,

[16] From Sgt. Ensor's testimony at the October 26, 2009 hearing, it is not entirely clear whether he compared one or more than one of the cartridges in Case No. 1496 with one or more than one of the cartridges in Case No. 9335. In any event, it is clear that he did not examine every cartridge.

Sgt. Ensor assumes that the cartridges in Case No. 1496 matched the City cartridges he did not examine, because a Baltimore City toolmark examiner—whose qualifications, proficiency, and adherence to proper methodology is unknown—said they did. Given the importance that the AFTE theory places on the experience and proficiency of the individual examiner, *see* Nichols, *supra*, at 589, the lack of information about who conducted the individual examinations in the City Case, as well as the lack of information regarding the examiner's qualifications, training, proficiency, and whether the examiner has been subject to annual proficiency CTS examination, as has Sgt. Ensor, is significant. The jury will be deprived of any information on which to evaluate what weight, if any, to be given to the Baltimore City examiner's conclusions.

Accordingly, because Sgt. Ensor's own opinion, for lack of a more elegant expression, piggybacks on those of an unknown Baltimore City examiner, I recommend that Sgt. Ensor not be able to express his opinions to the same degree of certainty as other courts have permitted in *Taylor*, *Glynn*, *Diaz,* or *Monteiro*. As noted, *infra*, I am recommending that Sgt. Ensor: (1) be permitted only to state his opinions and bases without any characterization as to degree of certainty (whether "more likely than not" or "to a reasonable degree of ballistic certainty") and that if Judge Quarles does not agree with its limitations, that, at a minimum, Sgt. Ensor not be allowed to opine that it is a "practical impossibility" for any other firearm to have fired the cartridges other than the common "unknown firearm" to which Sgt. Ensor attributes the cartridges (which the Government concedes it will not seek to have him do, Hr'g Tr. 10/26/09); (2) if Judge Quarles does not determine to impose this much of a restriction, then, alternatively, I recommend that Sgt. Ensor only be allowed to express his opinions "more likely than not," as in *Glynn*; or (3) at most, "to a reasonable degree of ballistic certainty," as in *Monteiro* and *Diaz*.

I note in making this recommendation that there is nothing in Rule 702, *Daubert*, *Kumho Tire*, or the other cases analyzing this type of evidence, that an expert is required to express any particular level of confidence in the degree of accuracy in his opinions. *See Samuel v. Ford Motor Co.*, 112 F. Supp. 2d 460, 470 (D. Md. 2000) (stating that an expert need not "testify with absolute certainty, or without any doubt whatsoever," provided that "the opinion has a tendency to prove a consequential fact by probability"), *aff'd*, 95 Fed. App'x 520 (4th Cir. 2004); *see also Glynn*, 578 F. Supp. 2d at 574 (an "exalted level of certainty" is not required for evidence to be admissible). Such an estimate, even if supported by the facts, goes to the weight of the evidence, not its admissibility. And, without a proper basis for supporting the confidence level testified to, there is a real danger of misleading the jury.

D. Qualifications of Sergeant Ensor to Testify

Having determined that, as qualified above, the Government should be permitted to introduce opinion testimony regarding firearms toolmark identification because such evidence is admissible under *Daubert*, *Kumho Tire*, and Rule 702, it remains to be determined whether Sgt. Ensor, the Government's witness, is qualified pursuant to Fed. R. Evid. 702—that is, whether he possesses sufficient "knowledge, skill, experience, training, or education" to offer helpful opinion testimony (qualified as mentioned, *supra*) on the subject of firearm toolmark identification. For the following reasons, I conclude that he does, with the restrictions already noted.

Sgt. Ensor has been with the Baltimore County Police Department ("BCPD") since 1983, and he has worked in the Forensic Services Section for more than twenty years. Docs. 223. In 1995, he completed a three-year training program in firearm and toolmark identification, based

on the AFTE Manual, at the Maryland State Police Crime Laboratory. Docs. 225. He attended the week-long AFTE National Training Seminar annually from 1995 through 2002, and also in 2004, 2006, 2008, and 2009. Docs. 228. In addition, he attended the two-day Eastern Regional Firearms and Tool Mark Training Seminar five times. Docs. 225-27. He also has attended week-long programs, such as the FBI "Specialized Techniques in Firearms Identification School" and Forensic Technologies Integrated Ballistics Identification System training, and a two-day workshop on source tool recognition. Docs. 226-27. Further, he "[p]articipated in developing and administering the procedures and standards affecting the Firearms Identification Unit for the Baltimore County Police Forensic Services Section, subsequently meeting the prescribed requirements of the American Society of Crime Laboratory Directors Laboratory Accreditation Board and achieving accreditation for the unit." Docs. 226. Sgt. Ensor is AFTE-certified in firearm and toolmark evidence examination and identification; he is a member of the AFTE; and he has passed the CTS firearms proficiency test annually since 1998. Docs. 229-41.

E. Documentation and Peer Review

With regard to documentation, the Government initially, on August 7, 2009, produced three reports that Sgt. Ensor prepared, dated August 10, 2007 ("Report 1"), September 27, 2007 ("Report 2"), and July 23, 2008 ("Report 3"). On or about October 16, 2009, the Government reproduced Reports 1 and 2, along with 239 pages that contain the documentation underlying Sgt. Ensor's identifications and the review done by other examiners to confirm it.[17] At the hearing, twenty-six additional documents of the same nature were produced. Hr'g Tr. 10/26/09.

[17] On October 21, 2009, the Government provided the Court with a binder of these same documents ("Docs.").

While this supplementation was appropriate, it came one week before trial, and such a belated disclosure is far from timely.

The supplemental documents produced on or about October 16, 2009, included another report from July 23, 2008 ("Report 4"), as well as sixty-three pages of documentation and photographs;[18] BCPD Standard Operating Procedures for Firearms and Toolmark Identification ("SOPs"); Sgt. Ensor's curriculum vitae; and the Certificate of Accreditation for the BCPD Forensic Services Division. Docs. 72-246. The documents produced at the hearing on October 26, 2009, included a report that Michael J. Thomas conducted on April 28, 2006 ("Report 5"); a report that Thomas conducted on August 27, 2007 ("Report 6"); a Comparison Verification sheet for Report 4, filled out on May 1, 2006; and supporting documents. Hr'g Tr. 10/26/09.

The documentation produced on or about October 16, 2009, includes Bullet and Cartridge Case Examination Worksheets, with photographs, that Sgt. Ensor prepared in February and July, 2007, Docs. 38, 39, 47, 51. Sgt. Ensor also prepared thirteen pages of additional notes with various comparison images and photographs, in January, February, and July 2007. Docs. 11, 18, 19, 20, 37, 42-46, 48-50, 52, 69. A number of the documents were completed by Officer Jeff Schaub, a firearms examiner trainee in the Firearms Identification Unit of the Forensic Services Section of the BCPD, under Sgt. Ensor's supervision: Bullet and Cartridge Case Examination Worksheets from January, July, and August, 2007, Docs. 16, 21, 23, 28, 29, 33; notes from January, February, June, and July, 2007, Docs. 10, 22, 34, 36, 35; IBIS Correlation Results and database search results from December, 2006, and February, 2007, Docs. 17, 24-27, 31-32, 40-41; and two comparison images, Docs. 30. The documents also included three Image

[18] Reports 3 and 4 appear to be based on the same examination and contain the same results. Report 4 was prepared for this case, while Report 3 was prepared for a separate case.

Comparison pages printed in June 2007, and initialed by Ofc. Schaub in July 2007, Docs. 12-14; notes and photographs in other cases, Docs. 9, 15; and twelve inventory pages, Docs. 54-65.

Summarizing, on August 7, 2009, one week before the deadline for filing defense motions, the Government produced Sgt. Ensor's first three reports, absent any supporting documents. After the motions were filed, and following the October 15, 2009 hearing, 239 pages of documents constituting the bases for Sgt. Ensor's reports were produced, and finally, at the October 26, 2009 hearing, an additional series of twenty-six documents were produced. While arguably produced in sufficient time to allow Defense Counsel to make eleventh hour preparations to use it at trial, the disclosure of the documents constituting the support and bases for Sgt. Ensor's opinions was requested as early as May 2009, and should have been produced under Fed. R. Crim. P. 16 far earlier than it was. Its belated production affected not only Defense Counsel, but also the undersigned's ability to conduct an effective hearing and complete a helpful report and recommendation.

What the late-produced reports do demonstrate is the documentation underlying Sgt. Ensor's opinions, and that his opinions were "peer reviewed" by other examiners, the two procedural conditions precedent to admissibility required by the *Monteiro* court. Also Sgt. Ensor's late-produced curriculum vitae shows his qualifications, discussed *supra*. Thus, with the restrictions stated in this Report and Recommendation, I find that Sgt. Ensor is qualified to provide opinion testimony in this case.

II. Defendant Mouzone's Rule 16 Motion

Defendant Mouzone claims that, as of the hearing on October 15, 2009, despite his repeated requests by mail, phone, and e-mail for "written reports, bench notes, photographs,

manuals, and laboratory standards relevant to the testing and for curriculum vitae of all examiners," the Government "has provided only the barest summary of the examiner's conclusions but nothing at all as to the bases of fact on which this opinion is based, nor the examiner's qualifications," nor "any other documents to support this intended conclusion." Def.'s R. 16 Mot. ¶¶ 3-5. Defendant Mouzone asserts that he first requested these documents from the Government on May 15, 2009, but the Government did not produce any documents until August 7, 2009, at which time it produced only Sgt. Ensor's conclusions. *Id.* ¶¶ 6-7. He points out that the Court-imposed pretrial motion deadline was August 14, 2009, and trial is set for November 2, 2009. *Id.* ¶¶ 7, 14. He insists that his resulting inability "to consult with an appropriate expert" prejudiced his defense and therefore "the appropriate sanction is to prohibit the government from introducing this evidence" at trial.[19] *Id.* ¶¶ 7, 11.

[19] It cannot seriously be denied that production of such important evidence, long in the possession of the Government, one week before the deadline for filing motions *in limine* raises the suspicion that the timing of the disclosure was calculated to place Defendant Mouzone at a tactical disadvantage in challenging the evidence.

At the hearing held on October 15, 2009, the Assistant United States Attorney who is prosecuting this case acknowledged that he had been in possession of the documents that memorialized the firearms toolmark identification evidence (but not the underlying photographs and notes) for two years, yet the press of other cases and the fact that this case was indicted as a multi-defendant case, prevented him from realizing earlier just how much information there was. He advised the Court that there had been no intent to hamper Defendant Mouzone's trial preparation.

I have no reason to question the sincerity or credibility of this explanation. However, to accept it is not to condone it. If Defense Counsel had not so vigorously pursued the matter and the Court had not been able to address it when it did, the delay in production might very well have warranted a harsher sanction against the Government than recommended by this Report and Recommendation. As it stands, while Defense Counsel and the Court have now been provided with all the materials that should have been produced, they were received less than two weeks—some only one week—before the trial starts. This is far too little time to enable either effective analysis and preparation of a rebuttal by the Defendant or deliberate consideration by the Court of any challenge to the admissibility of the toolmark identification evidence. This belated disclosure led to Judge Quarles having to refer this hearing to the undersigned to conduct an

Alternatively, Defendant Mouzone asked that the Court "order the government to immediately produce" the relevant documents. *Id.* ¶ 14. On October 16, 2009, after Defendant Mouzone filed his Rule 16 motion but without a Court order, the Government produced Sgt. Ensor's curriculum vitae and proficiency test results; bench notes from Sgt. Ensor and his colleagues; comparison images and other photographs; Comparison Verification sheets; BCPD's Firearms and Toolmark Identification SOPs; and the Certificate of Accreditation for the BCPD Forensic Services Division. Docs. 1-246. Further, on October 26, 2009, the Government produced additional reports and supporting documentation. Docs. 247-72.

Rule 16(a)(1)(F)-(G) provides:

> (F) **Reports of Examinations and Tests**. Upon a defendant's request, the government must permit a defendant to inspect and to copy or photograph the results or reports of any physical or mental examination and of any scientific test or experiment if:
>
> (i) the item is within the government's possession, custody, or control;
>
> (ii) the attorney for the government knows—or through due diligence could know—that the item exists; and
>
> (iii) the item is material to preparing the defense or the government intends to use the item in its case-in-chief at trial.
>
> (G) **Expert witnesses**.—At the defendant's request, the government must give to the defendant a written summary of any testimony that the government intends to use under Rules 702, 703, or 705 of the Federal Rules of Evidence during its case-in-chief at trial. . . . The summary provided under this subparagraph must describe the witness's opinions, *the bases and reasons for those opinions, and the witness's qualifications*.

Fed. R. Crim. P. 16(a)(1)(F)-(G) (*emphasis added*). It is undisputed that the Government did not provide Sgt. Ensor's qualifications or "the bases and reasons" for Sgt. Ensor's opinions until

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expedited hearing and prepare a Report and Recommendation, which itself will of necessity be issued within a week of trial. Thus, the Government's failure to live up to its Rule 16 obligations not only had serious adverse impact on the Defendant, but also on the Court.

October 16, 2009, five months after Defendant Mouzone's request and seventeen days before trial. Moreover, the Government did not complete its disclosure of Sgt. Ensor's reports and bench notes until October 26, 2009, one week before trial.

Rule 16 does not impose a deadline for the defendant's request or the Government's production, but "it is expected that the parties will make their requests in a timely fashion." Amendments to Fed. R. Crim. P., 147 F.R.D. 387, 473 (1993). In *United States v. Richmond*, 153 F.R.D. 7, 8 (D. Mass. 1994), the court addressed "the time within which the government must make the disclosure mandated by Rule 16(a)(1)(E)" (later relettered as Rule 16(a)(1)(G)). Reasoning that the Rule "'is intended to minimize surprise that often results from unexpected expert testimony, reduce the need for continuances, and to provide the opponent with a fair opportunity to test the merit of the expert's testimony through focused cross-examination,'" the court concluded that, to the extent possible, the Government should produce the requested summary "forthwith upon the defendant's request." *Id.* (quoting Amendments to Fed. R. Crim. P., 147 F.R.D. at 473). The court said that if "the government's trial preparation has not proceeded to the point where an expert's written summary has been prepared or can be prepared" when the defendant makes a Rule 16 request, then the Government must provide the summary "not less than forty-five calendar days before trial." *Id. Accord United States v. Palmero*, No. 99 CR. 1199, 2001 WL 185132 (S.D.N.Y. Feb. 26, 2001) (unpublished) ("Forty-five days prior to trial is not at all out of line with the purpose of the Rule.") (citing *Richmond*, 153 F.R.D. at 8-9).

Here, the Government's full disclosure was a far cry from "forthwith upon the defendant's request," *Richmond*, 153 F.R.D. at 8, trailing Defendant Mouzone's May 15, 2009, request by more than five months, and following Defendant Mouzone's Rule 16 motion and a hearing on the motion on October 15, 2009, Paper No. 669. Moreover, the Government's earlier

disclosure on August 7, 2009, was neither prompt nor complete. And, the Government conceded that it had the reports in its possession for two years prior to the request, attributing its tardy production to a miscalculation of the time needed to locate and produce the documents. Hr'g Tr. 10/15/09. Full disclosure came only week before trial.

The failure to produce the documents constituting the bases and reasons for Sgt. Ensor's firearms toolmark identifications was particularly troublesome in this case because, as the preceding pages of this Report and Recommendation attest, there is a substantial debate within the scientific community, as well as the Courts, regarding the degree to which firearms toolmark identification evidence passes muster under Fed. R. Evid. 702 and *Daubert.* As the literature, publications, and cases discussed earlier reveal, the subjectivity of firearms toolmark identification methodology places a great degree of emphasis on the individual's training and proficiency, and the AFTE methodology requires proper documentation by notes, sketches, and photographs that illustrate how the examiner reached his or her conclusions, so that other examiners may confirm the conclusions by reference to the supporting materials. The Courts that, in increasing number, have expressed concerns regarding the reliability of firearms toolmark identification evidence, have permitted its introduction in spite of their concerns, in substantial reliance on the ability of defense counsel to be able to challenge the identification at trial through effective cross-examination, or by offering defense experts to challenge it. In addition to the importance of effective cross-examination or rebuttal to the Court and the Defendant, it is even more important to the jury, which is charged with deciding how much, if any, of it to accept. In this context, the production seventeen days before trial of 239 pages of additional documents relevant to Sgt. Ensor's expert testimony (and that only after a motion had been filed and a hearing held), and the production one week before trial of twenty-six additional

pages is disdainful of the Defendant's due process rights to a fair trial, the Court's obligation to ensure one, and the jury's obligation to make sense out of a highly technical subject matter that has generated intense disagreement within the scientific, technical, and judicial communities.

"Rule 16 grants the district court substantial discretion in dealing with a violation of a discovery order." *United States v. Hammoud*, 381 F.3d 316, 336 (4th Cir. 2004), *vacated on other grounds*, 543 U.S. 1097 (2005). Indeed, a court may order discovery; "grant a continuance"; "prohibit that party from introducing the undisclosed evidence"; or "enter any other order that is just under the circumstances." Fed. R. Crim. P. 16(d)(2). The Fourth Circuit outlined the factors a district court should consider in applying appropriate sanctions for a discovery violation under Fed. R. Crim. P. 16(d)(2). It stated that the court:

> "must weigh the reasons for the government's delay and whether it acted intentionally or in bad faith; the degree of prejudice, if any, suffered by the defendant; and whether any less severe sanction will remedy the prejudice and the wrongdoing of the government."

Id. (quoting *United States v. Hastings*, 126 F.3d 310, 317 (4th Cir. 1997), *cert. denied*, 523 U.S. 1060 (1998) (identifying the factors with regard to imposing sanctions for the Government's refusal to comply with court-ordered discovery)). In *Hastings*, the Fourth Circuit held that "dismissal of the indictment against Hastings was an extreme and inappropriate sanction" because "[w]hen a court sanctions the government in a criminal case for its failure to obey court orders, it must use the least severe sanction which will adequately punish the government and secure future compliance." 126 F.3d at 317.

As noted, the Government's delay in producing the scant summary was occasioned by poor time management, which, however understandable, may not be condoned. The Government attributed its delay in producing the supporting documents to difficulty obtaining

the documents from the witness and his laboratory. Hr'g Tr. 10/15/09. Although these reasons do little to justify the delay, they do not suggest any intentional or bad faith conduct on the part of the Government.

As for prejudice, I find that the prejudice that resulted from the Government's initial incomplete disclosure was great. Firearms toolmark identification is "admittedly 'subjective' and based on experience and training of the individual examiner." *Monteiro*, 407 F. Supp. 2d at 366. Therefore, peer review and documentation are prerequisites to admissibility, and the examiner's qualifications are of utmost importance. *Id.* at 355. With regard to firearms identification testimony, documentation and verification of the basis for any identification are critical. *See id.* Without this information, and without any description of Sgt. Ensor's qualifications, the Government's August 7, 2009 summary did not provide sufficient information to be admissible at trial. *See id*. As a result, Defendant Mouzone could not determine the reliability of Sgt. Ensor's work, whether he had to defend against Sgt. Ensor's conclusions, or if so, how to build that defense. *See United States v. De La Rosa*, 196 F.3d 712, 716 (7th Cir. 1999) ("'A defendant is prejudiced under Rule 16 only when he is unduly surprised and lacks an adequate opportunity to prepare a defense, or when the violation substantially influences the jury.'") (citation omitted). *Cf. United States v. Taylor*, 857 F.2d 210, 215 (4th Cir. 1998) (concluding that there was no prejudice caused by the Government's delay in producing an FBI surveillance report because it "was largely duplicative of grand jury testimony" that the defendant already had received).

But, the prejudice caused by this incomplete disclosure has been tempered by the delivery of the requested documents in time for Defense Counsel to review the documents and consult an expert and for this Court to hold a hearing and proceed to trial. In this regard, *United States v.*

Stevens, 380 F.3d 1021 (7th Cir. 2004), is informative. There, the Government produced its fingerprint expert's report only one week before trial, but on the same day that the evidence came into the Government's possession. *Id.* at 1024-26. Reasoning that the defendant had the opportunity to cross-examine the Government's fingerprint witness, and could have requested a continuance to secure his own fingerprint expert, but failed to do so, the Seventh Circuit concluded that the defendant was not prejudiced by the Government's tardy disclosure under Rule 16. *Id.* at 1025-26. *See also United States v. Douglas*, 862 F. Supp. 521, 526 (D.D.C. 1994) (concluding that Government's failure to produce evidence in discovery did not prejudice defendant because defense counsel could have (but did not) request a continuance, which would have "alleviate[d] the prejudice"; noting that "[s]everal courts have held that when defense counsel fails to request a continuance after a discovery delay, such failure erases any potential prejudice created by the delay"), *aff'd without op.*, 70 F.3d 638 (D.C. Cir. 1995).

With regard to an appropriate sanction in this case, the merit of ordering production at this late juncture is moot, as the Government now has satisfied the request. *See United States v. Bates*, No. 02-80948, 2005 WL 2218902, at *5 (E.D. Mich. Sept. 13, 2005) (unpublished) ("The conventional remedies proposed by Rule 16(d)(2), such as permitting discovery of the undiscovered materials, are moot, given the ultimate disclosure of the reports."). Further, because the Government has satisfied the request, it would be too severe a sanction to dismiss the indictment or to bar the Government from introducing the evidence. *See Hastings*, 126 F.3d at 317.

While the late production by the Government has clearly imposed a burden on Defendant Mouzone's counsel in having to do last minute preparation for trial, there also is a monetary consequence, involving the expense of additional work by the court-appointed attorney to obtain

the documents at issue, and additional work by Defendant Mouzone's expert witness to challenge the admissibility of seemingly inadmissible skeletal reports that have since been substantiated. Recently, in *United States v. Jones*, 620 F. Supp. 2d 163 (D. Mass. 2009), after the prosecutor failed to disclose material exculpatory information from her notes after the defendant requested such information, the court found that the prosecutor exhibited "inexcusable ignorance, or a reckless disregard, of a constitutional duty," *id.* at 179, and concluded that the court could impose a monetary sanction on her and the United States Attorney's Office, *id.* at 178.[20] As authority, the court quoted Rule 16's provision for sanctions including "'any [ ] order that is just under the circumstances.'" *Id.* at 179 (quoting Fed. R. Crim. P. 16(d)(2)(D)). Alternatively, the court said that it had "the authority to impose monetary sanctions on [the prosecutor] as an exercise of its inherent supervisory powers." *Id.* (citing *Chambers v. NASCO*, 501 U.S. 32, 45-46 (1991)). It noted that "'a court's array of supervisory powers includes the power to assess attorenys' fees against other parties or their attorneys in befitting situations.'" *Id.* (quoting *United States v. Horn*, 29 F.3d 754, 760 (1st Cir. 1994)). However, in *Horn*, the First Circuit cautioned that although it would "consider unleashing the supervisory power in criminal cases '[w]hen confronted with extreme misconduct and prejudice,' in order 'to secure enforcement of "better prosecutorial practice and reprimand of those who fail to observe it,"'" the doctrine "applies only when there is no effective alternative provided by rule, statute, or constitutional clause." 29 F.3d at 760 (citations omitted).

My research has not uncovered any other case suggesting that monetary sanctions could be imposed for failure to comply with Rule 16. To the contrary, the Ninth Circuit held that

[20] Ultimately, the court did not impose monetary sanctions, requiring instead attendance at "an educational program concerning discovery in criminal cases" and a later showing of progress by the United States Attorney and the prosecutor, and a statement as to "why sanctions should not be imposed in this matter." *Id.* at 185.

monetary sanctions were not appropriate under Rule 16 because the Rule does not provide an express waiver of sovereign immunity and, unlike Fed. R. Civ. P. 11 and 37(b), Fed. R. Crim. P. 16 "provides no independent authority for a monetary sanction." *United States v. Woodley*, 9 F.3d 774, 781 (9th Cir. 1993). Similarly, in *Bates*, 2005 WL 2218902, at *5, the court concluded that "principles of sovereign immunity preclude ordering the government to reimburse" the defense for its expenditure of "additional time and limited monetary resources as a result of the government's Rule 16 violations." But, the court stated that its "Opinion and Order may appropriately be factored into any request for additional funds under the Criminal Justice Act." *Id.*

Of the possible sanctions, a continuance is most appropriate, if Defendant Mouzone requires more time for a defense expert to prepare for trial and if Defendant Mouzone is amenable to the postponement. To be sure, Defendant Mouzone did not expressly request a continuance. Nonetheless, a continuance is "just under the circumstances." Fed. R. Crim. P. 16(d)(2)(D). Should Defendant Mouzone request a continuance in order to attempt to locate a rebuttal expert to challenge Sgt. Ensor's identifications (Professor Schwartz is not a firearms toolmark examiner and therefore cannot express opinions regarding the actual identifications done by Sgt. Ensor), I would recommend that that request be granted. I also recommend that any additional funds be approved under the Criminal Justice Act to pay for any additional expert time on the part of Professor Schwartz or any other expert sought by Defendant Mouzone.

Further, to ensure that there are no future failings of this magnitude to live up to the letter and spirit of Rule 16, I recommend that Judge Quarles order the United States Attorney's Office to provide a written report which identifies any policies and training in existence regarding

compliance with Rule 16 discovery obligations, to include how the policy is implemented and monitored to ensure compliance.

Finally, I recommend that Judge Quarles not allow the Government to imply that the Defendant had, but did not take, the opportunity to hire an expert to visit the BCPD Forensic Services Division laboratory and review the evidence. Further, I recommend that Judge Quarles not allow Sgt. Ensor or any other Government witness to testify to that effect. Given that Defendant Mouzone repeatedly requested evidence in this case without receiving a response from the Government, it would be unfair to suggest that he had the opportunity to hire an expert or review the evidence.

III. Recommendations

I recommend:

(1) That Sgt. Ensor not be allowed to opine that it is a "practical impossibility" for any other firearm to have fired the cartridges other than the common "unknown firearm" to which Sgt. Ensor attributes the cartridges;

(2) Additionally, that Sgt. Ensor only be permitted to state his opinions and bases without any characterization as to degree of certainty (whether "more likely than not" or "to a reasonable degree of ballistic certainty");

(3) Alternatively, if you disagree with Recommendation No. 2, that Sgt. Ensor only be allowed to express his opinions "more likely than not";

(4) Alternatively, if you disagree with Recommendation Nos. 2 and 3, that Sgt. Ensor only be allowed to express his opinions "to a reasonable degree of ballistic or technical certainty" (or any other version of that standard);

(5) That Defendant Mouzone be granted a continuance to attempt to locate a rebuttal expert to challenge Sgt. Ensor's identifications, if he so requests;

(6) That additional funds be approved under the Criminal Justice Act to pay for any additional expert time on the part of Professor Schwartz or any other expert sought by Defendant Mouzone to testify at trial, if permitted by the Court;

(7) That the United States Attorney's Office be required to provide a written report which identifies its policies and training regarding compliance with Rule 16 discovery obligations, to include how the policy is implemented and monitored to ensure compliance; and

(8) That the Government not be permitted to argue or imply that the Defendant had, but did not take, the opportunity to hire a firearms toolmark identification expert to visit the BCPD Forensic Services Division laboratory and review the evidence, and that no Government witness be permitted to testify that such an opportunity existed.

Dated: October 29, 2009

_____/S/_____
Paul W. Grimm
United States Magistrate Judge